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WEAPON SYSTEM REPLACEMENT OPERATIONS WITHIN A HEAVY DIVISION

A thesis presented to the Faculty of the U.S. Army Command and General Staff College in partial fulfillment of the requirements for the degree

MASTER OF MILITARY ART AND SCIENCE

by

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B.B.A., Stephen F. Austin State University, Nacogdoches, Texas, 1980.

Fort Leavenworth, Kansas
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The objective of this thesis is to determine whether a heavy division can conduct weapon system replacement operations. The thesis is based on a scenario that takes place in Eastern Europe. The division is a balanced Mechanized Infantry Division conducting a deliberate defense. The U.S. Army has limited works on the conduct of the operation. The only time this type operation has taken place is during Desert Storm. The thesis incorporates the structure, and lessons learned from the Desert Storm operation. This information was gained by administering a questionnaire to members of the operation. A copy of the questionnaire results are included in the thesis. The analysis is based on the scenario, current and past U.S. Field Manuals, and the operation conducted in Desert Storm. The analysis demonstrates what is required for a division to conduct the operation. Five areas of the operation are analyzed: Command and Control; Organizational Structure; Replacement Crew, Weapon System Link-up; Logistical Support; and Training. The conclusion is that a division can conduct weapon system replacement operations.

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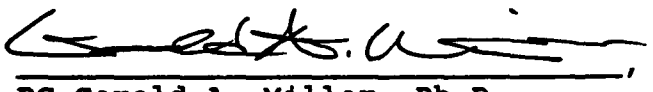 , Member, Consulting Faculty
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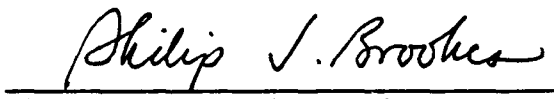 , Director, Graduate Degree Programs
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The opinions and conclusions expressed herein are those of the student author and do not necessarily represent the views of the U.S. Army Command and General Staff College or other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

CAN A HEAVY DIVISION SUPPORT WEAPON SYSTEM REPLACEMENT OPERATIONS by Major Thomas J. Richardson, USA, 84 pages.

The objective of this thesis is to determine whether a heavy division can conduct weapon system replacement operations. The thesis is based on a scenario that takes place in Eastern Europe. The division is a balanced Mechanized Infantry Division conducting a deliberate defense.

The U.S. Army has limited works on the conduct of the operation. The only time this type of operation has taken place is during Desert Storm. The thesis incorporates the structure, and lessons learned from the Desert Storm operation. This information was gained by administering a questionnaire to members of the operation. A copy of the questionnaire results are included in the thesis.

The analysis is based on the scenario, current and past U.S. Field Manuals, and the operation conducted in Desert Storm. The analysis demonstrates what is required for a division to conduct the operation. Five areas of the operation are analyzed: Command and Control; Organizational Structure; Replacement Crew, Weapon System Link-up; Logistical Support; and Training.

The conclusion is that a division can conduct weapon system replacement operations.

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I would like to express my appreciation to the following individuals: Major Tim Hunt, CPT (P) David Ling, and CPT (P) Steave Edwards. Without their assistance in completing the questionnaire, on the weapon system replacement operations, I could not have completed this thesis.

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CHAPTER I

INTRODUCTION

On the battlefields of today and tomorrow the commander must employ and sustain decisive combat power. The commander must sustain his fighting force with well trained crews and combat weapon systems. The commander that can quickly reconstitute destroyed weapon systems with trained crewed weapon systems will maintain the momentum of his operation. An effective way for commanders to replace lost weapon systems is through weapon system replacement operations.

What is weapon system replacement operations? A weapon system replacement operation is a method to supply the combat commander with a fully operational replacement weapon system. It is a procedure for bringing a weapon system to a ready-to-fight condition and handing it off to the combat unit.[1] The division is the lowest level at which weapon system replacement operations are performed.[2]

Statement Of The Problem

The basis of this thesis is the question, can a heavy division support weapon system replacement operations? In todays Army the logistical system within a heavy division is already over burdened with manning, arming, fixing, and

fueling of the subordinate units. It is a lot to expect of a division to conduct normal day to day sustainment functions, be mobile, and conduct weapon system replacement operations while in combat.

Statement Of The Sub-Problems

Within this basic question there are several secondary questions to answer. This thesis will answer the following secondary questions:

1. How and where can the division generate the assets needed to conduct weapon system replacement operations?
2. Who will train the replacement crews?
3. How does the crew marry up with the replaced weapon system?
4. Who supports the crew while they are training?
5. What element commands and controls the weapon system replacement operation?
6. What ancillary items will the crews need that are not part of the weapon system or the individual?
7. What equipment will the unit conducting the training need?
8. What external logistical support will the weapon system replacement team need to conduct training?
9. What is the time frame to conduct weapon system replacement operations crew training?

Answering these secondary questions will determine the requirements of a weapon system replacement operation.

I will be able to determine if a heavy division can support weapon system replacement operations by answering these secondary questions.

Definitions

In order to continue we must have an understanding of the following concepts and definitions:

Reconstitution. Is an extraordinary action that commanders plan and implement to restore units to a desired level of combat effectiveness. This action must be balanced with mission requirements and available resources. It transcends normal day-to-day force sustainment. There are two sub-components of reconstitution, regeneration and reorganization.[3]

Regeneration. Is the rebuilding of a unit. It requires a large scale replacement of personnel, equipment, and supplies. Normally a division can control a battalion/task force regeneration. A unit can conduct regeneration two echelons below it.[4]

Reorganization. Is actions taken to shift resources within a degraded unit to increase the unit's combat effectiveness. Commanders of all types of units at each echelon conduct reorganization.[5]

Ready-for-issue-system. Is a weapon system that has been removed from its previous condition of preservation and made mechanically operable. The system is made operable according to current equipment serviceability criteria or

other appropriate standards. All ancillary equipment, (fire control, machine guns, radio mounts, and radios), are installed. The vehicle is fueled and basic issue items are aboard.[6]

Ready-to-fight system. Is a crewed ready-for-issue system with ammunition stowed aboard. The weapon has been bore-sighted and verified.[7]

Weapon system manager. At the division level is assigned by the division support command commander. He works out of the division's material management center. He interfaces with the other weapon system managers at brigade (the S-4) and battalion level (the battalion executive officer). The manager must keep abreast of not only the weapon systems within the division, but also the crew members available and systems coming into the division.[8]

Weapon system replacement operations. Is a management tool used to supply the combat commander with a fully operational major weapon system. Procedures for issuing weapon systems differ from those for issuing other major end items (class VII). A flow diagram of weapon system replacement operations is in Appendix C, Figure 1.[9]

Incoming weapon systems from CONUS are deprocessed by a heavy materiel supply company in the Theater army area command or the corps support command areas. The major end items are then transported to corps or divisions where they are made ready-for-issue. Within the division the support

command's supply and service company accomplishes this function.

The division obtains personnel replacements from two sources. The first is from personnel replacements arriving in Theater and transported to the corps rear area. They are then transported forward to the division support area. The second source of replacements are "return to duty" personnel from divisional medical facilities. Within the division support area the replacements are formed into crews. Crew requirements are decided by the weapon system manager located at the division support command's materiel management center. The weapon system manager and the replacement company must work closely together in order to formulate the right mix of personnel. The replacement company must know the status of projected "returned to duty" personnel and projected replacements due in from corps. This allows them to come up with the right mix of personnel. This data should be relayed to the weapon system manager who compares this information with projected inbound and current on hand weapon systems.

The primary link-up point of crew with the weapon system is in the division support area. The division support command commander organizes the link-up point with supply, transportation and maintenance elements. The crewmen working with the support personnel make the weapon system ready-to-fight.

Conditions permitting and based on the experience level of the crew, the division provides time and facilities for crew-weapon familiarization and training or checkout in the link-up area. This training should include gunnery, driving, enemy and allied vehicle identification, air defense procedures, standard operating procedures, and other appropriate to the operational environment. It is not intended this training be elaborate, but to familiarize the crews with operating conditions in the combat zone.

The weapon system manager is the glue that holds this process together. He must coordinate closely with the maintenance management officer of the division materiel management center. He does this to verify the status of weapon systems being repaired in direct support maintenance. He must also coordinate with the corps weapon system manager. This coordination is to determine what replacement weapon systems are due into the division. The manager also coordinates for what personnel are available, the link-up point elements and training personnel.[10]

Importance Of The Study

Why is weapon system replacement operations important in today's Army? The importance was first demonstrated in World War II in the European theater of operations. The Army needed to marry crews up with tanks. The system was conducted at corps level. However, the Army

had difficulties getting weapon systems and crews together and forward to the divisions that needed them the most.[11]

The 1973 Arab-Israeli War is an excellent example of the importance of reconstitution on the modern battlefield. The most significant difference between the 1973 Arab-Israeli War and WWII is the lethality of weapon systems. During the 1973 war the Israelis had approximately 2,000 tanks and 4,500 armored personnel carriers. They lost approximately 800-1,000 tanks and 1,500-2,000 personnel carriers during the eighteen days of battle. On top of the equipment loss, the Israelis had 2,222 killed in action and 5,596 wounded personnel. Roughly half of the losses came from the armor corps.[12]

The Israelis had to overcome these losses quickly in order to maintain the momentum of the war. They had a problem with regenerating new weapon systems. The Israelis did not have an industrial base that could produce combat systems. The weapon systems they had were foreign bought. The Israelis over came this problem by regenerating their combat systems. They did this by repairing the damaged systems and replacing personnel forward. The regeneration operations were conducted during hours of darkness after each days battle. What could not be repaired forward was evacuated to the rear depots for repair. The Israelis had the ability to evacuate to their depot level maintenance since they were fighting on home soil.[13]

The "fix forward" concept that the Israelis adopted was the key to their success. Putting weapon systems back into the combat commanders hands was how the Israelis maintained the momentum of the war.

The need to have ready-to-fight replacement weapon systems on the battlefield has not changed over the years. The Arab-Israeli War of 1973 clearly demonstrates the importance of how we must replace combat systems in order to maintain the momentum of the fight. If anything the requirement for replacing weapon systems has grown since the introduction of the Bradley Fighting Vehicle. The Army states in FM 101-10-1 that twenty percent of damaged weapon systems are not repairable.[14] Therefore, the U.S. Army must have a procedure to get a ready-to-fight weapon system to the combat commanders. This procedure is essential to replace the twenty percent non-repairable weapon systems. Weapon system replacement operations is the procedure we use to give commanders ready-to-fight weapon systems. However, the U.S. Army has never conducted weapon system replacement operations at division level. The closest the Army has come to conducting weapon system replacement operations was at the theater army level during Operation Desert Storm. It is imperative to determine whether our doctrine is correct in having a division conduct weapon system replacement operations at their level. Particularly, since this doctrine is how we will fight our next war.

CHAPTER II

LITERATURE REVIEW

The primary concentration of literature on weapon system replacement operations is in U.S. Army Field Manuals and studies. The literature review for this thesis is focuses on four areas: current publications, key works, apparent trends, and utility of the works.

Current State of Publications

In the early 1980's airland battle doctrine came into being for the U.S. Army. The first logistical manuals that address weapon system replacement operations were FM 100-16, Support operations: Echelons above Corps, and FM 100-10, Combat Service Support, both which were published in 1983. These manuals address the framework of weapon system replacement operations. They also provide a brief overview of how the operation works on a macro-level. The following manuals are the U.S. Army's current primary written sources on weapon system replacement operations:

FM 100-9, Reconstitution. This manual primarily deals with how to regenerate large units and the considerations involved in the reconstitution process. The manual briefly mentions weapon system replacement operations. However, it does not incorporate the many

functions of the operation, nor the integration into the reconstitution process.[1]

FM 100-10, Combat Service Support. This manual outlines the general framework for weapon system replacement operations. The manual provides a definition of weapon system replacement operations. It also shows how the weapon system manager collects the information he needs through the use of the weapon system report. The manual outlines the flow of the weapon system from the theater level to the division. It indicates the division is the primary link-up point for the weapon system and the personnel.[2]

FM 100-16, Support Operations: Echelons Above Corps. This manual provides the best framework of weapon system replacement operations. The manual provides a flow diagram that depicts the overall process. It illustrates the flow from battalion level to theater army level for replacements and weapon systems. The central focus of the manual is how the weapon system managers and weapon system reports interface. The flow diagram also depicts the link up points for the weapon system and the personnel.[3]

Training and Doctrine Command PAM 525-51, US Army Operational Concepts for Reconstitution On the Airland Battlefield. This manual provides a general definition and guidance on weapon system replacement operations. It states that under normal circumstances the division support command converts weapon systems to a ready-to-fight status. It also recommends that weapon systems should be configured into

unit sets. These sets are to facilitate rapid reconstitution of units, if resources are available. The amount of systems required is based on projected losses. The unit sets can be formed into either platoon or company sets, which ever best fits reconstitution process.[4]

FM 12-6, Personnel Doctrine. The manual outlines the basic framework of weapon system replacement operations. It uses the same flow diagram and focus as FM 100-16. The manual does not provide any insight on how to manage the replacement crews within the personnel replacement flow. However, it does state that the weapon system manager should have a person from the division personnel section. This person acts as a liaison between the weapon system manager and the AG section.[5]

FM 63-2, Division Support Command, Armored, Infantry, and Mechanized Infantry Divisions. This is the main field manual for a heavy division support command. As the primary "how to manual" for a division support command it only provides duties and responsibilities for the weapon system manager. The manual does not provide details on how the weapon system manager conducts the weapon system replacement operation.[6]

FM 63-21, Main Support Battalion. This manual is the main field manual for the main support battalion in a heavy division. It describes the integration of the weapon system managers within the division. The manual has a flow

diagram of the weapon system reporting structure, weapon system, and personnel flow. However, the manual does not go into detail on how to conduct the operation.[7]

Analytic Survey of Personnel Replacement Systems in Modern War. This survey conducted by T. N. Dupuy and associates focuses on the history of replacement systems. The focus of the publication is on how the U.S. replacement system evolved from WW I through the Vietnam war. There is no historical reference of a similar system to weapon system replacement operations.[8]

Unit Reconstitution, A Historical Perspective. This study conducted by Dr. Edward J. Drea focuses on unit reconstitution primarily during World War II. This study brings out that in WW II the army tried to move replacements for armor divisions to the divisional vehicle pool. The divisional vehicle pool is where repaired and new equipment for a particular division is placed. However, First Army reported difficulty in matching the replacements up with the vehicles and recommended that crews be individually requisitioned.[9]

Reconstitution-Winning Beyond The First Battle. This study conducted in 1988 by LTC Hinebaugh analyzes the importance of reconstitution on the modern battlefield. The study uses the Arab-Israeli War in 1973 in a historical perspective of the lethality of modern warfare. It also shows how Israel used reconstitution to maintain the momentum of the war. They maintained the momentum by

reconstituting combat systems forward. The study does not address weapon system replacement operations. However, the study does show the necessity to rapidly regenerate weapon systems to the combat commanders.[10]

Key Works in the Field

The key works that form the basis of this study are FM 100-16, Support Operations: Echelons Above Corps; Echelons Above Corps Study and Weapon System Replacement Operations (Test) publication. FM 100-16 outlines how weapon system replacement operations are incorporated throughout the theater of operations. The document provides the best overview of what weapon system replacement operations are. This document places the primary responsibility of weapon system replacement operations on the division support command. The Echelons above Corps Study is the source document for the concept of weapon system replacement operations. However, the study does not provide any insight as to how a division conducts this operation and the resources needed.[11]

The Weapon System Replacement Operations (Test) Publication was published in 1981 by the United States Army Training and Doctrine Command. The original purpose of the publication was as a users manual for weapon system replacement operations. However, the manual never advanced beyond the test phase. The manual is based on FM 100-16 (Draft). It does not go into detail on how a division is to

execute weapon system replacement operations. The publication goes into detail on how the different weapon system managers interface with one another. It also shows the importance of the weapon system report to gather the information needed by the managers. The manual is a rehash of the current field manuals. It provides no direction to the division or any other element on how to conduct the operation. The manual reaffirms the concepts outlined in the various field manuals.[12]

Apparent Trends

The apparent trend is for the Army to continue with the limited works that are currently in publication. The reason is that the weapon system replacement operations conducted in Operation Desert Storm were not documented and actually not needed. There was an apparent requirement for weapon system replacement operations in Desert Storm based on projected losses. However, since the actual losses were minimal the operation went away without much recognition.

Since the time that weapon system replacement operations were first introduced in 1983, the definition and explanation of the operation has not changed. The explanation in the 1983 version of FM 100-16 is the same as the current version. Due to the complexity of weapon system replacement operations it is an area in which units do not train. This is due to the fact that the operation is resource intensive, in both equipment and personnel.

Utility of Works to the Investigation

The current and past publications demonstrate there is a requirement for weapon system replacement operations. However, the publications do not provide the division with insight into how to conduct weapon system replacement operations. The basic publications do illustrate how a division receives the weapon system and personnel. However, they do not instruct the division as to how to conduct the operation, nor detail the resources that are required.

CHAPTER III

RESEARCH METHODOLOGY

I have divided this research on weapon system replacement operations into three parts. The first details the methods I used to conduct the research. The second addresses the flow of the research. The third and final part explains the questionnaire used.

Methods

I began looking at weapon system replacement operations from an historical perspective. However, I quickly found there was very little in writing on the subject from an historical perspective. I then turned to the military aspect of where weapon system replacement operations originated. This search lead me to the conclusion that very little is written on the subject.

The next step was to tap into the experience I gained as a member of the weapon system replacement training team in Desert Storm. Since this is the only known operation of this kind, I decided to use this source of information. I developed a questionnaire to present to other personnel who were part of the operation.

I intend to use the information in the Army manuals and from the questionnaire and apply it to a division

scenario. I will use the scenario as the medium to facilitate the analysis. This analysis will prove or disprove my hypothesis that a heavy division can support weapon system replacement operations.

Research Flow

In order to divide the research task into a workable system, I developed four phases in which to conduct the research. The four phases were: (1) Researching Primary Sources; (2) Research of Army Regulations; (3) Research Secondary Sources; and (4) Conducting Interviews.

In Phase 1 I concentrated on finding primary written sources relating to the reconstitution of ground forces. I conducted this research by doing a literature search at the Fort Leavenworth Combined Arms Research Library. This search included not only books but periodicals and other published papers written on reconstitution. Once the search was completed and the sources reviewed, I transitioned to Phase 2 Researching Regulations and Manuals.

In Phase 2 I started researching Army Regulations and Manuals. This phase provided me with the bulk of documented information on weapon system replacement operations. I began my search with the regulations and manuals relating to logistics. The next step was the review of regulations and manuals that address personnel replacement operations. I researched not only current publications, but researched manuals dating back to the year

1949. While researching the older publications I came across a reference to an Echelons Above Corps Study. This study is the earliest reference on weapon system replacement operations. After exhausting all the possible logistical and personnel publications, I decided to research secondary sources.

Phase 3, Secondary Sources was a time consuming process. I took primary sources that I had gathered during Phase 1 and used their bibliographies as possible sources. During the review of the bibliographies I chose only the sources that related to reconstitution , personnel replacement operations, and equipment replacement operations to review.

Also during Phase 3 I contacted the Defense Logistics Studies Information Exchange, (DLSIE). This was an excellent source of information for matters relating to Department of Defense logistical issues. I requested bibliographies and abstracts in the areas of reconstitution, weapon system replacements operations, and the Yom Kipper War. Out of this search I obtained one of my key works, Weapon System Replacement Operations (Test) publication. I also obtained studies on the Yom Kipper War. I used these studies as an historical perspective on the importance of reconstitution in modern warfare.

The last portion of Phase 3 was to go to the Center for Army Lessons Learned located at Fort Leavenworth. The center has a logistics data base that was established in

1986. The composition of the data base is lessons learned and observations from units conducting various operations. I searched this logistical data base and talked with the logistics coordinator. The data base did not have any lessons learned or observations on weapon system replacement operations, or reconstitution that applied.

The Fourth Phase is when I conducted interviews based on a questionnaire. I will discuss the questionnaire in more detail later in this chapter. I administered the questionnaire to four persons including myself. All of the personnel were members of the Southwest Asia training team. This team was responsible for the conduct of weapon system replacement operations during Operation Desert Storm. This was the only weapon system replacement operation conducted during the Persian Gulf War. The four individuals represent a cross section of the team. One of the individuals was a mechanized infantry company trainer, two were armor company trainers and the fourth was the logistics officer for the operation. Upon the completion of the interviews, I compiled the information gained. This compiled information is the basis of how to execute weapon system operations. This information is used in the development of the scenario. This completed the four phases of the research. The results of the interviews are in Appendix B.

Questionnaire Development

The questionnaire was developed to capture information on the weapon system replacement operation conducted during Operation Desert Storm. The resulting information will establish the basis of how to conduct the operation. This is extremely important since none of the literature researched covered how to conduct the operation.

The questionnaire was submitted through the appropriate channels at Command and General Staff College and approved. The focus of the questionnaire was on the conduct of the mission, training requirements, external and internal logistical requirements, command and control, duration of training, team organizational structure, and other concerns that pertained to the success of the operation. The end product of the questionnaire was to determine the "how to portion" of the operation. An example of the questionnaire is in Appendix A.

The questionnaire is a critical link in capturing vital information on the only known wartime weapon system replacement operation. The information is used in the scenario on how a division can conduct the weapon system replacement operation.

Strengths and Limitations

The strength of this study is the compilation of past history in weapon system replacement operations. The research provides a complete historical perspective of when

the operation became part of U.S. Army doctrine. The thesis examines the past conflicts of the Yom Kipper War and World War II. It emphasizes the importance of reconstitution on the modern battle field since WWII. The questionnaire provides information not previously compiled. It provides data on how the U.S. Army conducted weapon system replacement operations during operation Desert Storm. All the afore mentioned provides a complete historical analysis of weapon system replacement operations.

The limitation of the study is that it does not incorporate classified data or documents. The scope of the study is limited to how weapon system replacement operations affects a heavy division. The analysis within the division is limited to two primary weapon systems, tanks and armored personnel carriers. These two weapon systems are used since they are the most prevalent systems in the division. They also represent the primary direct fire weapon systems for the division.

CHAPTER IV

SCENARIO, REQUIREMENTS AND CAPABILITIES

The analysis of the thesis revolves around a particular scenario. This scenario provides the necessary background information and sets the stage for the analysis. It also allows for the logical flow of the procedures for conducting weapon system replacement operations within a heavy division.

Following the description of the scenario, the requirements will cover the expected equipment and personnel losses. The next step is to determine the division's capabilities. After the capabilities are determined, the listing of the requirements needed to conduct weapon system replacement operations is addressed.

Scenario

This scenario is fiction and was taken from the Command and General Staff College's C320 European Operational Situation practical exercise. However, the possibility of U.S. forces being deployed in some part of the former Soviet Union or Eastern Europe is likely. This is a good representative scenario from which to conduct the analysis on weapon system replacement operations.

Situation

Continued destabilization and debilitating developments in the western region of the former Commonwealth of Independent States resulted in a power vacuum. Disenchanted military officers and hard-line Communists seized power throughout the region and established the state of Krasnovia. The government has repressed internal dissents and then intervened to suppress ethnic unrest Romania. This has reversed the democratic trends of the past ten years.

The United Nations and NATO pursued various approaches to end the crisis in Romania, but were powerless to bring it to an end. Poland was the next to fall to Krasnovia. Poland feeling threatened by Krasnovia seized pre-positioned stocks. They also terminated basing rights and denied any future basing rights to Krasnovia.

Krasnovia struck quickly into Poland to protect its military interests. The former Commonwealth of Independent States forces that were in the former East Germany declared allegiance to Krasnovia and relocated to Poland. This action resulted in Germany, France, United Kingdom and the United States to declare the Four Plus Two Agreement. U.S. military forces are deployed in the region. However, they are not deployed in the former East Germany, so as not provoke the Krasnovians.

The Krasnovian strategic objective is to reestablish control of Eastern Europe. Their operational objectives are

to reestablish the buffer provided by the old Warsaw Pact, and prepare to defend along the old inter-German and Czech borders, and repel Nato counterattacks.

In response to the enactment of the Four Plus Two Agreement the United States has deployed the 10th U.S. Corps. The Corps is comprised of the 25th Armored Division, 52nd Infantry Division (Mech), and the 209th Armored Calvary Regiment. All Units have deployed and have received their missions. For the purpose of this thesis I will only concentrate on the 52nd Infantry (Mech) Division.[1]

52nd Infantry (Mech) Division's Mission

The Division is to defend in sector to block threat second-echelon Divisions from penetrating phase line light.

In order to succeed the division commander has decided to employ all three brigades a breast with a Tank Company in reserve. The division will have at least 72 hours to establish the defense with the 209th Armored Calvary conducting a covering force mission in front of the division. The commander anticipates the division destroying the second echelon divisions no earlier than three days after initial contact is made.

Composition Of The 52nd Infantry (Mech) Division

The 52nd Infantry (Mech) Division is a fictional division. The division is organized according to the Table of Equipment (TOE) 87-J. The division is comprised of the following units: Infantry Headquarters and Headquarters

Company; Signal Battalion; Calvary Brigade Air Attack; Engineer Brigade; Chemical Company; Division Artillery; Air Defense Artillery Battalion; Military Intelligence Battalion; Armor Brigade Headquarters and Headquarters Company; Two Infantry Brigade Headquarters and Headquarters Companies; Military Police Company; five Infantry Battalions; five Tank Battalions; and the Division Support Command.[2]

In order to later address the capabilities of the division's logistical system we must set the organization of the Division Support Command. The Division Support Command consists of the following units: Headquarters and Headquarters Company and Material Management Center; Transportation Aircraft Maintenance Company; three Forward Support Battalions; and a Main Support Battalion.[3] The portion of the Division Support Command that this thesis will concentrate for logistical support is the Main Support Battalion.

The Main Support Battalion for this thesis is organized based on the Table of Organization 63-135J. The following units comprise the Main Support Battalion: Headquarters and Headquarters Detachment; Transportation Motor Transport Company; Supply and Service Company; Heavy Maintenance Company; Light Maintenance Company; Medical Support Company; and a Missile Support Company.[4]

The company that performs the majority of the supply functions for the division, minus repair parts, is the

Supply and Service Company. The Supply and Service Company consists of the following sub-units: The Company Headquarters; Supply Platoon consisting of three sections, Platoon Headquarters, Class II, IV, and VII section; Petroleum Platoon; and the Water and Class I Platoon.[5]

The combat units for this thesis are the five Tank Battalions, Five Infantry Battalions and the Division Calvary Squadron. As stated earlier, this thesis will address weapon system replacement operations for the M1 Tank and the M2/M3 Bradley Infantry Fighting Vehicle. The total number of M2/M3's that an Infantry Battalion has is 60.[6] The total M1's that a Tank Battalion has is 58 and it also has 6 M3's.[7] The Calvary Squadron has 40 M3's.[8] The Division has a total of 290 M1 Tanks (5 Tank Battalions X 58 Tanks), and a total of 370 M2/M3's {(5 Infantry Battalions X 60) + (5 Tank Battalions X 6) + (40 X 1 Calvary Squadron)}.

Division Logistic Capabilities

The logistical capabilities that this thesis is interested in are those of the Supply and Service Company of the Main Support Battalion. The reason for this is the it is the only company that handles Class VII (Major End Items). The company is also the main storage area for the division for all classes of supply except class IX (repair parts) and class V (ammunition).

The capabilities of the Supply and Service Company (TOE 42-7J) are derived from FM 101-10-1/1.[9] The unit at level one, provides the following:

1. Can receive and provide temporary storage for, and issues 39.185 short tons of Class I (rations),; 58.055 short tons of class II (general supplies); 10.285 short tons of class III package (lubricant); 22.1 short tons of Class IV (building material); and 23.97 short tons of class VII (Major end items), less aircraft, and communications and electronics equipment.

2. Provides up to five water supply points in the division support area and brigade support areas for purification and distribution.

3. Can store 30,000 gallons and issuing 120,000 gallons of water per day. It can distribute 12,000 gallons based on two trips per day.

4. Is capable of storing and issuing 302,600 gallons of bulk petroleum per day. Can distribute 197,200 gallons based on two trips per day. It also operates mobile roadside filling stations to refuel transit vehicles.

5. Operates a salvage collection point for mainly Class II items.

6. Provides food service support for units assigned to the Main Support Battalion, except for the medical company.

7. Maintains the division's reserve supplies and equipment for which the company is responsible.

These capabilities provide the basis for whether the division can conduct weapon system replacement operations. The next step determines the losses and requirements.

Requirements

Equipment Losses And Requirements

The losses the division can expect are a estimate based on FM 101-10-1/2.[10] The enemy forces are not expected to use nuclear or biological weapons and limited use of chemical is expected. Based on these facts the loss calculations are computed at the mid-intensity conflict level.

Tank or Bradley losses are any incident that precludes the weapon system from performing the assigned mission. The loss may be caused by battle damage, crew failure, or maintenance failure. For the purpose of this analysis the division has a good maintenance system and is 100 percent operational ready. Another factor is the Corps and Theater are established and able to support the division with repair parts. For planning purposes 80 percent of calculated losses are repairable by unit and intermediate maintenance. This is based on maintenance simulations where the average repair time for repairable losses were 10 man hours.

The loss rates are based on a mid-intensity conflict in the European Theater with a threat to friendly ratio of 3

or 4 to 1. The loss factors for day one through three are: 22 percent for day one; 12 percent for day two; and 6 percent for day three.

As discussed earlier in this Chapter the division has 370 M2/3 Bradleys. The total catastrophic losses for M2/3's are:

Day One: 16

(370 M2/3 X .22 = 81.4; 81.4 X .80 = 65.12; 81.4 - 65.12 = 16.28 round to 16).

Day Two: 7

(370 - 81.4 = 288.6; 288.6 X .12 = 34.6; 34.6 X .80 = 27.7; 34.6 - 27.7 = 6.9 round to 7).

Day Three: 4

({288.6 + 65.12} - 34.6 = 319.12; 319.12 X .06 = 19.15; 19.15 X .80 = 15.32; 19.15 - 15.32 = 3.83 round to 4).

For the three days of battle the division has a projected total loss of 27 M2/3 Bradleys.

The division has 290 M1 Tanks to start the battle with. The total catastrophic losses for the M1's are:

Day One: 13

(290 X .22 = 63.8; 63.8 X .80 = 51.04; 63.8 - 51.04 = 12.76 round to 13).

Day Two: 5

(290 - 63.8 = 226.2; 226.2 X .12 = 27.14; 27.14 X .80 = 21.72; 27.14 - 21.72 = 5.42 round to 5).

Day Three: 3

(226.2 + 51.04 = 277.24; 277.24 X .06 = 16.64; 16.64 X .80 = 13.31; 16.64 - 13.31 = 3.33 round to 3). The total losses for M1 Tanks for the three days of conflict are 21.

The total losses of 27 M2/3 Bradley's and 21 M1 Tanks provide the essential data to compare the division's capability to support weapon system replacement operations. In order for the division to maintain the momentum of the fight the division must replace these weapon systems. The total impact of these weapon systems to the division is about a battalions worth of combat power. The next requirement is to calculate the personnel needs of the weapon systems.

Personnel Losses And Requirements

The losses and the requirements for personnel requires intensive management by the division G1/AG. In order for weapon system replacement operations to work properly the replacements for the first two days of conflict must be pushed forward based on equipment losses. The reason for this is that the division is estimating the total loss based on weapon systems. Also, the division will have a natural lag in their reporting system. In the fog of battle the most some commanders may know is they need "X" amount of weapon systems. They may not know the total amount of personnel by type that they need. To provide the

replacement weapon system to the field commanders for the next days fight, the division must have the replacement crews in advance. This will allow the division to match the loss reports with the number of incoming replacements and the return-to-duty personnel within the division.

For this scenario the division requires 18 M1 Tank and 23 M2/M3 Bradley replacement crews. The total replacements for the M1 Tanks are 72 personnel and 69 personnel for the M2/3 Bradley. The personnel requirement for the third day and follow on operations is more complicated. The follow on days personnel requirements must take into account personnel (part of crews) that are returned to duty and personnel available that do not have a weapon system to man.

The way a division manages the follow on personnel requirements that are crew dependent is by the weapon system report. This report provides the G1 with information on the number of crews needed for a particular weapon system. The weapon system manager uses the report to determine the amount of the various weapon systems needed. The weapon system report identifies the requirement for fully crewed weapon systems for the division.

For the purpose of this analysis the Corps is sending the required crews for day one and two. Also, the weapon system reports indicate that the division requires two additional fully crewed M2s and 3 M1s.

External Support

The division is supported by the 10th COSCOM. The COSCOM supports the division with a Corps Support Group (FWD). The Group is located in the vicinity of the division's rear boundary. The Corps Support Group will support the division with Ammunition, Field Services, Bulk Petroleum, Transportation, General Supplies, and Back up Maintenance Support. The Corps Support Group is sufficiently manned and organized to support the division.

In addition to the Corps Support Group the COSCOM will provide a MASH for medical support. The Corps also provides personnel services that include a replacement section from the Corps replacement company. The division will receive Class VII (major end items) from the Heavy Materiel Supply Company positioned in the Corps rear area.

The Heavy Materiel Supply Company currently has sufficient M1s and M2/3s to support the division's initial three day requirements. The Heavy Materiel Supply Company is currently making the weapon systems ready-for-issue. The Company anticipates the first shipments of 13 M1s and 16 M2/3s arriving at the division on D minus 3. The next shipment of 5 M1s and 7 M2/3s on D minus 2. The third shipment of 3 M1s and 2 M2/3s on D minus 1.

The Corps is able to send the initial crews that are needed for the first three days of the conflict. The Corps Replacement Company has the crews available. The crews are to arrive at the replacement detachment located in the

division support area. The first crews earmarked for weapon system replacement operations will arrive at the replacement detachment on D minus three. The second increment of replacement crews are expected to arrive at the replacement detachment on D minus two. The third increment of replacement crews are due to arrive on D minus one. These are not the only replacements that are sent to the division. The next step is to determine the personnel requirements, based on the projected three days of combat operations.

Personnel replacement requirements for the division are an estimation based on FM 101-10-1/2.[11] The estimates are based on the Armored Division. The reason for this is the data in the manual is a representative analysis of the Korean War and World War II. In both of these wars Armored Personnel Carriers were not used. Also, in todays Army an Armored Division has six Tank Battalions and four Infantry Battalions, verses five and five in a Mechanized Infantry Division. Therefore, for the purpose of this analysis the Armored Division data is used instead of the Infantry Division data.

The personnel strength of the 52nd Infantry (MECH) Division is 16,247 authorized and assigned strength is 15,435 (95%). The percentage of loss for the first day of combat is 3.5 percent and 1.9 percent for succeeding days. The first step is to compute the total losses. After the total losses are computed, the next step is to calculate the

infantry and armor losses. These losses are a percentage of the total loss.

1. Total Losses:

Authorized strength of division	16,247
Assigned strength 1st day	15,435
Losses, 1st day, (3.5% X 15,435)	540
Assigned strength end of 1st day	14,895
Losses, 2nd day, (1.9% X 14,895)	283
Assigned strength end of 2nd day	14,612
Losses, 3rd day, (1.9 X 14,612)	278
Assigned strength end of 3rd day	14,334

2. Infantry Losses:

1st day losses (62% X 540)	335
2nd day losses (62% X 283)	175
3rd day losses (62% X 278)	172
Total	682

3. Armored Losses:

1st day losses (23.1% X 540)	125
2nd day losses (23.1% X 283)	65
3rd day losses (23.1% X 278)	64
Total	254

The division will have 682 Infantry losses and 254 Armor losses for the projected three day battle. The next step is to compute the return-to-duty personnel. This is calculated on the medical patient flow. The return-to-duty

personnel are subtracted from the total losses which provides the total replacements required.

The medical evacuation policy in the Theater of Operations determines the amount of returned-to-duty personnel the division can expect. The evacuation policy also depends on the maturity of the Theater. In this scenario the Theater is considered mature and has an established medical infrastructure. With this in mind, the Theater evacuation policy is 30 days and the Corps evacuation policy is 7 days. The types of battle losses are killed, wounded and captured/missing. According to FM 101-10-1/2, the percentages that pertain to each of these types are: 18% for killed; 72% for wounded; and 10% for captured\missing.[12] This provides us with the basis of what the actual wounded are that need treatment which is 72% of the total losses. To determine the needs of each branch of causalities I will determine the return-to-duty rate for each branch.

The Infantry branch is expected to have 682 losses. Out of the 682 losses 28% will not return-to-duty, because they were either killed, missing or captured. This calculates to 191 personnel, which replacements are needed at this point. The wounded personnel that must be treated is 491 personnel (682 - 191). Out of the 491 losses 1% will die of wounds which is 5 persons, and 36% are treated by the Company aidsmen and Battalion Aid Stations and returned-to-duty, which is 175 persons. This leaves 311 that are

evacuated to the Brigade and Division Clearing Stations. At the Brigade and Division Clearing Stations 47% are returned-to-duty, which is 146 personnel. The rest of the losses, 165, are then evacuated to the Corps Hospitals. At the Corps 2% will die of wounds which is 3 persons. Out of the those evacuated 23 will be returned after approximately seven days. For the purpose of this scenario of a three day battle these personnel will need to be replaced. This analysis provides us with an approximate total of 321 returned-to-duty personnel out of the 682 losses. Therefore, the division will need 361 Infantry replacements.

The Armor branch battle losses were estimated at 254 personnel. Out of the 254 losses 28% were killed, missing or captured, for a total of 71 personnel. This leaves 183 personnel that were evacuated through the medical system. Between the Company aidsmen and the Battalion Aid Stations 1% are died of wounds (2 personnel) and 65 persons are returned to duty (36%). The remaining 116 personnel are evacuated to the Brigade and Division Clearing Stations. Out of the 116 personnel, 54 are returned-to-duty (47%). This leaves 62 personnel that are evacuated to Corps Hospitals. At the Corps Hospital one person will die of wounds and 9 are returned-to-duty after approximately seven days. Since the division's battle is projected to take only three days the return-to-duty personnel at the Corps level require replacements. This analysis of the Armor losses

provides 119 Armor branch returned-to-duty personnel. Therefore, the division will require 135 Armor replacements for the projected three day battle.

Based on the projected losses by Infantry Branch and Armor Branch and the returned-to-duty analysis, the division will require 361 Infantry and 135 Armor replacements. In the earlier analysis of projected weapon systems required, the determination was that the division needed 27 M2/3 Bradleys and 21 M1 Tanks. This provides a requirement of 81 Infantry personnel for crews for the M2/3s and 84 Armor personnel as M1 Tank crews. The replacement personnel required to conduct the weapon system replacement operations does not exceed the total required replacements by branch for the division. The personnel requirement for the M2/3 is twenty two percent of the total Infantry replacements. The personnel requirement for the M1 is sixty two percent of the total Armor replacements.

Training Requirements For Replacement Crews

The division G-3 has established the training requirements for the crews that are part of the weapon system replacement operations. He has also developed a training team to train the replacement crews.

The G-3 has divided the training requirements into two categories, active duty replacements coming from stateside units and AIT/individual ready reserve replacements. The G-3 has talked with the G-1 and

anticipates only having replacements from stateside units. However, he has training guidance for both categories of replacements.

The training requirements/tasks for the active duty replacements to be conducted in three days are as follows:

1. Familiarization with the Rules of Engagement.
2. Prepare weapon system for combat.
3. Boresight and verify all weapon systems.
4. Intelligence update.
5. Limited Crew drills.

The training requirements for the AIT/individual ready reserve are expected to take 5 days and incorporate the above requirements and the following:

6. Additional crew drills
7. Vehicle identification
8. Preventive Maintenance
9. Additional time and training in boresighting and verification.

The training team that was developed is modeled after the weapon system replacement operation conducted in Desert Storm. The Model is designed for platoon packages for training purposes. This does not mean that these weapon systems have to be deployed as platoons. The minimum number of trainers are used due to the limited number of personnel to conduct this training. These personnel have to come out of the divisions organic infrastructure.

The training model is as follows:

1. 1 each OIC (Officer in Charge). In charge of the entire training operation for all weapon systems. This could be a 1LT, CPT, or a Master Sergeant.
2. 1 each NCOIC to assist the OIC, and to conduct coordination.
3. 1 each NCO in the grade of Staff Sergeant or Sergeant First Class per platoon. These NCO's should be 19K's for the Armor platoons and 11M's for the Infantry platoons.

The training team will need the following equipment to conduct the training:

1. 2 each M998 with two radio net capability.
2. 1 each compass per trainer.
3. 1 each night vision goggles per trainer.
4. 1 each carpenters tool kit (for constructing targets)

The training model/team is austere. However, the team can provide the essential organization to conduct the training. The training is not intended to be elaborate, but is designed to build crew confidence. The crew must know that they can depend on their weapon system. They must also know what to expect from the enemy. This training will help ease their anxieties.

Crew Ancillary Equipment

Even though a crew receives a weapon system in a ready-to-issue state, there are additional pieces of equipment needed to make it ready-to-fight. These pieces of

equipment are normally supplied by the organic company. Ordinarily the company's MTOE provides these pieces of equipment. Since these are replacement weapon systems the division must provide the additional pieces of equipment.

The division has two options in how it provides this equipment. The first is for the gaining unit to provide the equipment. This may seem to be the easiest way, however, the company will have to obtain the equipment from the division. This option will add time and may result in the crew going into battle not fully equipped. The second method is for the Supply and Service Company of the Main Support Battalion to issue the items directly to the crew. The crew can sign for the items when they sign for the weapon system. This allows the crew to form and train with the weapon system fully operational, ready-to-fight. This was a lesson learned in the weapon system replacement operation in Desert Storm.

The following equipment is deemed necessary as a result of the weapon system replacement operation conducted in Desert Storm:

1. CVC Helmets for all crew members.
2. 5 gallon water cans two per vehicle
3. Compass one per vehicle
4. GPS system if available
5. Binoculars, one per vehicle
6. Tie down straps

7. Cleaning equipment (brushes, rags, solvent, ect.)

8. Camouflage system

In addition to these individual items the Supply Company will need to have Basic Issue Items available that maybe missing from the weapon system. This too was a problem in the Weapon System Replacement Operations in Desert Storm. Some of the more important items were:

1. 3/4 in socket set

2. Boresight kit

3. Grease gun

4. Tanker bar

This is not an inclusive list of Basic Issue items needed. The stockage of items and quantity stocked is based on the types and quantities of weapon systems issued. The best source of information on required Basic Issue Items is the corresponding vehicle technical manual. In addition to the Basic Issue Items some additional authorized items may be required. They also are found in the vehicle technical manual.

Now that the scenario, capabilities and requirements are established, the next step is to conduct the analysis of how the division conducts weapon system replacement operations.

CHAPTER V

ANALYSIS

This analysis is based on the scenario outlined in Chapter IV of this thesis. Chapter IV also outlines the division's capabilities and requirements to conduct the defense in sector mission in the scenario. The analysis will analyze how the division can conduct weapon system replacement operations without external support.

The first item that the division must decide upon is who will command and control the operation? The second step for the division is how is the organization structured? The next step is to determine how the replacement crews marry up with the replacement weapon systems and where? The fourth step is who and how do you logistically support the operation? Last but not least is how and where training is conducted? These five areas are the basis of the overall analysis of how a division conducts weapon system replacement operations?

Command and Control

To determine the best command and control element for the operation the main players must be identified. The main players are: The weapon system manager; The G-3 of the division; The Supply and Service Company of the Main

Support Battalion; The G-1 of the division; and the Division Support Commander. Each of the main players provide an essential element for the mission accomplishment of the weapon system replacement operation.

The weapon system manager is located at the Division Material Management Center. He is appointed by the Division Support Command Commander. His primary responsibilities are to interface with the battalion weapon system managers using the weapon system reports. He keeps abreast of the weapon systems within the division. He analyzes the report for complete weapon systems needed (crews and weapon systems). He then determines whether the battalions need just crews or just the weapon system. He also coordinates with the Corps weapon system manager to articulate the divisions needs and what is available to the division. These relationships are depicted in Appendix C, figure one. He is assisted by a representative of the G-1 who coordinates for the crews and coordinates with the replacement detachment. The weapon system manager also coordinates with the Class VII (major end items) manager in the Division Material Management Center for incoming weapon systems. This two person section (weapon system manager and personnel representative) is not structured for commanding and controlling the entire weapon system replacement operation. The overall operation is to vast for the weapon system manager to control. He is a key player in the coordination of the assets needed and is the key link for the weapon system report.[1] Over burdening this

staff section could result in not properly managing the total weapon system needs for the division.

The division G-3 is in charge of organization, operations and training for the division.[2] There is a training requirement for the replacement crews. In Chapter IV it is stated that the G-3 is to provide a training team for the weapon system replacement operation. However, the G-3 during war is more concerned with the organization of the division and conduct of the division's current mission. The location of the G-3 is not in the proximity of the weapon system replacement operation. Even though the G-3 is responsible for the training, he is removed by distance for the purpose of command and controlling the operation. He does have a representative in the division rear command post. However, this person is already overburdened with requirements.

The Supply and Service Company of the Main Support Battalion provides the main logistical support to the operation. However, the company is already stressed in the area of command in control. This is due to the diversified missions the company conducts that were outlined in Chapter IV. The company commander does not have the depth of knowledge of the total requirements involved with weapon system replacement operation.

The division G-1's major responsibilities are: unit strength management, personnel services support, and the replacement operations for the division.[3] His staff is

coordinating for the replacement crews as well as other replacements for the division. He has a small staff and is concerned with all the functions associated with personnel management of the division. He does not have the staff to command and control the weapon system replacement operation.

The Division Support Command commander is responsible for the overall logistics execution for the division. He is collocated with the division rear command post and has a complete staff infrastructure. He controls the logistic functions of weapon system replacement operations. He is responsible for the consolidation of the weapon system reports through the weapon system manager. He does depend on a training team from the G-3 and the replacements from the G-1. The Division Support Command commander is by doctrine responsible for making the weapon system ready-to-fight.[4] Therefore, for the purposes of this thesis the Division Support Command commander is the command and control element for weapon system replacement operations within the division.

Organizational Structure

Now that the Division Support Command commander is identified as the command and control element, what structure is needed to accomplish this mission. In order to establish a structure the key players that execute weapon system replacement operations must be identified. The key players are: weapon system manager; training team; Supply

and Services Company, Replacement Detachment; and the Division Support Command commander. To have a successful operation each of the elements have to be synchronized. This is an adhoc organization that normally does not work with each other. For the operation to work there has to be a strong leader that can link and synchronize the elements together. The Division Support Command commander is entirely to busy to micro-manage this one activity. However, the operation is an important one that warrants visibility. I recommend the Division Support Command commander delegate this responsibility to head this adhoc organization. This individual could be the Division Support Command executive officer, Main Support Battalion commander, or the Division Support Command support operations officer. The individual should have the knowledge of the overall scope of the operation. He should have the ability to influence those elements that are part of the Division Support Command. He also should have the rank and the stature to deal with the G-3 and G-1 on training issues and replacement issues.

With the Division Support Command responsible for the overall conduct of the operation it provides the following structure: Division Support Command with the following elements reporting to it: Weapon System Manager and the G-3 weapon system replacement operations training team. The other elements are in a normal support relationship. The Supply and Service Company coordinates

with weapon system manager, provides the weapon systems to the crews and logistically supports the operation (see logistics). The Replacement Detachment provides the crews and coordinates with the weapon system manager for arrival and disposition. Both the Supply and Service Company and the Replacement Detachment coordinate with the G-3 training team.

In synopsis, the Division Support Command is the overseer of the entire operation. The weapon system manager manages the requirements and coordinates for the weapon systems and replacements. The G-3 training team coordinates with the weapon system manager. He also interfaces with the Replacement Detachment for crews, and the Supply and Service Company for the weapon systems and logistical support for the crews and the training.

Replacement Crew, Weapon System Link-Up

The replacement crews and the weapon systems processes are two separate entities as they come into the division. The replacement crews come from the Replacement Company in the Corps rear or the Replacement Company in the Theater rear area to the Replacement Detachment or section at the division. The Replacement Detachment is located within the Division Support Area. The Replacement Detachment notifies the weapon system manager when the crews arrive. The weapon systems come into the division from the Heavy Materiel Supply Company located in the Corps rear

area. The weapon systems arrive by either rail or by heavy transport (HET) to the Class VII section of the Supply Platoon, Supply and Services Company. Once the weapon systems arrive the weapon system manager is notified. After both the replacement crews and the weapon systems have arrived then the link-up can occur.

The G-3 training team conducts the link-up. They coordinate with the Supply and Services Commander for transport of the crews to the location were the weapon systems are located. This link-up should not be a great distance, since both the weapon systems and the replacements are located in the Division Support Area. The G-3 training team should know in advance from the weapon system manager of the approximate delivery dates of replacement crews and the weapon systems. As stated in Chapter IV, this is coordinated by the weapon system manager in advance. The weapon systems and the replacements are due into the division on D minus three, D minus two and D minus one. If the weapon system manager is doing his job the G-3 training team will know the approximate dates so that transportation is coordinated for in advance. As time gets closer to the arrival, the training team can follow up on the replacements and weapon systems if they are a dedicated team. If the training team is not formed yet, the team OIC should keep abreast of the status of the operation. He can do this through the weapon system manager or the Division Support Commander's representative in charge. If the team is not

formed they will need additional coordination in order to assemble the team. The team should be formed at least the day prior to the operation start date.

Logistical Support

The Supply and Services Company is the primary logistical supporter of the entire operation. Within the Company the Supply Platoon as discussed in chapter IV provides the weapon system, rations, and ancillary equipment. The Class V (ammunition) is provided by the Corps Ammunition Transfer Point (ATP). The platoon will have to coordinate for the basic load of ammunition as prescribed by the Division G-3. They will also have to coordinate for transportation to pick the ammunition up from the Corps ATP.

The Petroleum Platoon provides the Bulk class III and package products. The Heavy Maintenance Company of the Main Support Battalion provides a maintenance contact team for the operation. The Medical Company provides medical support for the training.

The Supply and Service Company will coordinate with the weapon system manager for disposition of weapon systems. They then coordinate with the G-3 Training team for the link-up of the crews and the signing over of the weapon systems to the crews.

When the Class VII section conducts the transfer of the weapon systems to the crews the ancillary items that are

listed in Chapter IV should be available and issued at the same time. Each crew inventories the weapon system in accordance with the hand receipt. The crew also inventories the Basic Issue Items (BII) listed in the vehicles "10" manual. Any shortages that are critical to the operation of the equipment should be issued by the Class VII Section. The G-3 Training Team ensures that proper inventories are conducted and is the honest broker of what Basic Issue Items are critical to mission accomplishment.

The Supply and Services Company also provides the following support:

1. Bivouac area for the crews
2. Three days of MREs for the training
3. Water
4. Fuel
5. Package Class III
6. Ammunition (basic load)
7. Personal Basic Issue Items (Sleeping bags, OCIE)
8. Storage of the crew's B bags

All of the supplies should be available at the issue point. Time is a consideration, the Supply and Services Company should make this process user friendly. They should coordinate with the training team for the lay out. The Supply and Service Company provides the necessary logistics to the crews and the training team to ensure they have smooth training event.

Training

The G-3 Training Team is the critical link in the weapon system replacement operation. The team coordinates with the other elements to ensure the crews link-up with the equipment. They also make sure that the crews have what they need to go to war. The training provided is not elaborate and is designed to familiarize the crew with the environment and the weapon system. The training sequence is derived from the G-3 training guidance provided in chapter IV. The training guidance incorporates the training schedule done in operation Desert Storm for weapon system replacement operations. The training is conducted in three days and consists of the following tasks:

Day One: Inprocessing Day

1. Replacements inprocess into the division

2. Replacements link-up with training team and given briefing on upcoming events. Chain of command is established within the replacements.

3. Inventory of personnel equipment. Equipment is repacked by the division standard operating procedure (A-Bag, B-Bag, Ruck Sack). Shortages identified, to be filled by the Supply and Services Company.

4. Transported to Bivouac area, located in walking distance to the Issue Area.

5. Conduct limited training if time permits.

Day Two: Equipment Draw/Training

1. Inventory weapon systems. Takes approximately four hours. Ensure shortages are made up.

2. Conduct Preventive maintenance checks (PMCS) according to "10" manual.

3. Load "A" Bags, ruck sacks, and BII. Load BII based on "10" manual. Load other equipment based on Division standard operating procedure for load plans.

4. Disassemble and clean weapons. (machine guns)

5. Move and Draw Class III, Class III package, Class I (rations) three day supply.

6. Move and Draw Class V basic load.

7. Configure Load plan for vehicle based on Division Standard Operating Procedure.

8. Move to an assembly area

9. Conduct classes on Rules of Engagement.

Day Three: Weapon System Firing/Training

1. Move to ranges.

2. Familiarize and zero individual weapons.

3. Boresighting of vehicle weapon systems.

4. Vehicle conducts verification

5. Conduct intelligence update. Types of vehicles to expect, formations and tactics.

6. Move to Log Pac. Rearm, refuel and resupply with three days of rations.

7. Move to assembly area and prepare to move to units.

Day Four: Weapon systems move to new units. This is done by HET or by driving to the appropriate Brigade Support Area.

This training is conducted in platoon packages as described in Chapter IV. For this first iteration of weapon system replacement the training team consists of an Officer in Charge, Non-Commissioned Officer in Charge; three tank platoon trainers and four M2/3 platoon trainers. The total training team consisted of nine personnel.

The peak training is the first day since they are to replace the first day casualties. In the start of any battle the first day casualties are usually the highest. Therefore, the training team will always be larger at the beginning of a operation and then taper off. A possible secondary mission for the training team is to train the individual replacements. They can do this mission when they are not doing weapon system replacement operations. The training could consist of enemy tactics, rules of engagement and other appropriate tasks.

The training outlined is austere and fast paced. The training is based on the scenario described in Chapter IV. Each division will have to determine the training requirements based on experience, mission, enemy, terrain and time (METT-T).

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

This chapter will draw the conclusions from the analysis that was provided in Chapter V and the Requirements and Capabilities of the scenario in Chapter IV. The conclusion is focused on whether or not a heavy division can support weapon system replacement operations. The conclusion will also answer the nine secondary questions outlined in Chapter I. The second portion of this Chapter provides various recommendations.

Conclusions

The conclusions drawn will incorporate the four areas that were covered in the Analysis Chapter. The four areas are: Command and Control; Organization; Replacement crew, weapon system link-up; Logistics; and Training. The overall conclusion is whether the heavy division can support weapon system replacement operations.

The Command and Control of the operation is based on the analysis in Chapter V. It is best suited for the Division Support Commander to have overall responsibility for the operation. Doctrine supports this as stated in FM 100-10. However, in support of this the Division Support Commander is situated in the Division Support Area where the

operation is conducted. He also has under his control the logistics functions for the operation and the weapon system manager. The other functions of the operation that are not in the direct control of the Division Support Commander are the Replacement Detachment and the training team. In order for the operation to be successful the training team should be attached for the operation. This provides the Division Support Command commander control over the elements necessary to execute the operation. The only element not in direct control is the Replacement Detachment. However, the Replacement Detachment is located in the Division Support Area and can be coordinated with easily. Therefore, the most practical commander is the Division Support Command commander for the command and control of the operation. There are no real limitations or reasons for the Division Support Command commander not to be the command and control element. Since the Division Support Command commander is the command and control element for the operation a organizational structure is required.

The organizational structure that was developed in the Analysis Chapter incorporated the main elements that either manage the process or execute it. The Analysis determined that the Division Support Command commander is responsible for the operation, but is too busy to actually over see the day to day operations. Therefore, the Division Support Command commander should delegate to a senior representative who is given the over sight responsibilities.

He should have the depth of knowledge and the rank to interface with the different elements to accomplish the mission. The only execution element that is not within the Divisions Support Command's direct control is the Training Team. The Training Team will need to be attached to the Division Support Command. This will allow for one commander for one mission. The Division Support Command can easily absorb the nine plus member Training Team. This also allows the Division Support Command to synchronize the operation without outside interference, and adapt to any unforeseen circumstances that may arise. This structure allows for one commander in charge, integrated management, and the ability to have flexibility if the need arises. The structure will accommodate the operation and pulls the existing elements together under one command.

The division has the logistical ability to conduct weapon system replacement operations. First, the Supply and Services Company based on the capabilities outlined in Chapter IV can support the supply functions of the operation. The only area that is of concern is the Class VII Section.

The Capabilities state that it can process, store and issue approximately 24 short tons of equipment. This is far below what is needed to conduct weapon system replacement operations. The first day requirement for the division are 13 M1 Tanks and 16 M2/3 Bradleys, one M2/3 is approximate 23 short tons. The Class VII Section can

therefore only process one M2/3 Bradley and since a M1 Tank is approximately is 67 short tons the division could not ever process one tank. This capability is suspect because the data derived from FM 101-10-1 is based on WWII and Korea. I believe that the Class VII section can process these pieces of equipment since they do not have to store the equipment. The process is simplified since the crews are assisting in the inventory of the equipment and the equipment is not being stored. Based on the experience of the weapon system replacement operation in Desert Storm it requires approximate four persons to issue the equipment out. Also, the equipment is in a ready-for-issue state since it has been deprocessed by the Heavy Material Company at Corps. If by chance that additional personnel are needed to support the operation the Supply Platoon can augment the section for the initial surge of equipment. Therefore, I believe that the Class VII Section is more than capable of conducting this mission.

The Supply and Services Company with augmentation of medical support and maintenance support from the Medical and Heavy Maintenance Companies can easily support the entire operation. The logistics capabilities except for the fore mentioned possible Class VII problem can be supported out of the Division Support Area and support the weapon system replacement operation.

The training requirements for the operation is austere and fast paced. The training is the responsibility of the G-3, but under the control of the Division Support Command Commander. As stated in Chapter IV and V the G-3 must have the training plan and designate the training team since the Division Support Command does not have the capability to conduct the training. The various doctrine manuals minimize the requirement for the training and address the operation from a logistical standpoint. However, the Army during Desert Storm thought it was important enough to dedicate a training team for the operation.

The outlined training tasks in Chapter IV are basic tasks. They are intended to familiarize the replacement crews based on the scenario and on the G-3's guidance. Creation of the training team is the responsibility of the G-3. This is because the Division Support Command does not have the qualified personnel to conduct the training internally. This will be a burden on the division to come up with the nine personnel to conduct the mission. However, it is critical that the crews have the structured training, so that they have the confidence to fight in the follow on battles. The battalions will not have the time to familiarize these crews when they get to their assigned companies since they are conducting combat operations. The commitment to conduct the early on training will add to the

combat capabilities of the replacement crews and take the burden off of the battalions that are in contact.

Weapon system replacement operations will be successful if the G-3 commits this Training Team and attaches them to the Division Support Command. The division can conduct this operation if it dedicates the Training Team.

The link-up of the replacement crews and the weapon systems is a critical event. The weapon system manager must closely manage the incoming weapon systems and the incoming replacement crews. He must have good interface with the Corps weapon system manager for incoming weapon systems and with the Replacement Detachment for replacement crews. The only way the division can make the operation work is with the support of the Corps.

Chapter IV presents the requirements for weapon systems and personnel for the scenario. In both cases the early arrival of the weapon systems and personnel will not put the Division over strength in either category. It shows that weapon system replacement operations will provide the division about a battalions worth of combat power, given the three days of conflict. Therefore, the Corps should support the operation based on the estimated requirements.

To conclude whether the division can conduct this mission I will address each of the sub-problems that were presented in Chapter I. There are nine secondary questions to answer:

1. How and where can the division generate the assets needed to conduct weapon system replacement operations? The division will rely on the Corps for the replacement crews and weapon systems. The other assets, minus the training team, are generated out of the organic division's logistics infrastructure. The replacement section of the division supplies the administration plus the command and control for the replacement crews. The Division Support Command supports the other logistical functions associated with the operation. The operation is conducted in vicinity of the Division Support Area. This is most logical area since it is where the replacements and equipment are located.

2. Who will train the replacement crews? The G-3 will have to establish a training team. This team has to come out of the existing personnel within the division. For this scenario the team is nine members and is attached to the Division Support Command. This attachment provides continuity to the operation.

3. How does the crew marry up with the replaced weapon system? The training team is the critical connection for the link up of crew with the weapon system. The training team coordinates with the weapon system manager to find out when the replacements and weapon systems are available. The weapon system manager coordinates with the replacement detachment and the division class VII officer.

The training team coordinates for transportation from the replacement detachment to the weapon system issue yard.

4. Who supports the crew while they are training? The crew and the training team is supported mainly by the Supply and Service Company of the Main Support Battalion. The company supports the crew for LOGPAC operations. They are augmented by a Maintenance Contact Team, and a Medical Team.

5. What element commands and controls the weapon system replacement operation? As stated earlier the Division Support Command commander commands and controls the operation.

6. What ancillary items will the crews need that are not part of the weapon system? The ancillary items required by the crews are listed in Chapter IV. It is important that the supply and service company have these items available in support of the operation. Without these items the crews will not be able to conduct training. The items are not only needed for training but make the weapon system ready-to-fight.

7. What equipment will the unit conducting the training need? The training team will primarily require vehicles and radios for the operation. A detailed listing of the equipment requirements are outlined in Chapter IV.

8. What external logistical support will the weapon system replacement team need to conduct the training? The only support required to conduct the operation will be

ammunition. The ammunition will have to come from the Corps ATP. The Supply and Service Company will have to coordinate for pick-up and transport of the ammunition. All other logistical support is available within the Division Support Command.

9. What is the time frame to conduct weapon system replacement operations crew training? Based on the established scenario the training will take three days. The amount of training required is dependent upon the type of replacement crews the division receives. In this scenario the crews are active duty crews that were sent to theater as replacement crews. Therefore, the crews do not require extensive training. At the division level the crews for weapon system replacement operations should be already formed and trained in crew drills. The division only has time to train the crews on theater specific items like the rules of engagement, enemy situation and weapon system verification. The training program at division level is designed to build crew confidence in the new weapon system.

The overall conclusion is that the heavy division can support weapon system replacement operations. However, the division must have the replacement crews and weapon systems from Corps. The division also must dedicate a training team and agree to a command and control structure.

Recommendations

The weapon system replacement operation outlined in this thesis is an adhoc organization. If a division is to be successful at conducting the operation it must have a written standard operating procedure, and it must practice the operation in peace time.

The standard operating procedure must incorporate the duties and responsibilities of the weapon system manager, training team, replacement detachment, and the logistical requirements. In addition the G-3 should outline a comprehensive training plan. The training plan should give the training team the specific training requirements and references.

The division should practice the operation. This operation could be done at home station during a BCTP exercise. During the exercise the various pieces of equipment can be assembled, training team formed, replacement crews formed and placed under the Division Support Command for execution. The operation can use the scenario given for the BCTP and requirements needed. The weapon system manager can interface with the Corps, Replacement Detachment and the Supply and Services Company. This will allow the division to refine the standard operating procedure and see where shortfalls exist.

Weapon system replacement operations can be done at division level based on the given scenario. The division must practice this operation like any other system within

the division. The division that can conduct the operation can give the combat commanders the weapon systems needed to succeed on the modern battlefield. This was proven valuable to the Israelis and is valuable to the U.S. Army.

APPENDIX A

QUESTIONNAIRE

PURPOSE: The purpose of this questionnaire is to establish the logistical, command and control, and training requirements of the Weapons System Replacement Operation conducted during Operation Desert Storm.

1. PERSONAL INFORMATION:

Name: Rank: Branch:

Position during operation:

Job Description:

2. LOGISTICAL REQUIREMENTS:

A. INTERNAL TEAM REQUIREMENTS:

a. Internal team personnel requirements to train one platoon:

b. Internal Team equipment used:

c. Internal Team Equipment needed that was not available:

d. Training equipment needed to support mission:

e. Other internal team logistical requirements:

B. EXTERNAL TRAINING REQUIREMENTS

a. Ammunition required to test equipment:

b. Ancillary items needed that are not part of equipment: (maps, compasses, ect.)

c. Range requirements:

d. Medical support requirements:

e. Fuel requirements:

f. Ration (Class I) requirements:

g. Maintenance Requirements:

h. Other requirements:

2. COMMAND AND CONTROL:

a. What was the chain of command structure:

b. Who coordinated equipment draw:

c. Who coordinated the training requirements:

d. How did you communicate on the range:

e. Who coordinated for internal team needs:

3. TRAINING REQUIREMENTS:

a. What were the different accessed/prescribed training levels:

b. What were the train-up time requirements per accessed training level:

c. Describe the scope of the training conducted:

d. How many platoons were trained:

e. How did you lash up with the training platoons at the start of the training:

f. How did you conduct range training:

g. What were the main components of the training:

h. Other comments on the training:

4. ADDITIONAL COMMENTS:

APPENDIX B

QUESTIONNAIRE RESULTS

The weapon system replacement operation was conducted during Operation Desert Storm. The mission of the team was to provide ARCENT with infantry and armor ready-to-fight weapon systems. The operation was conducted at Theater level. The team consisted of 116 personnel. The team came from the 7th Army Training Command. For the most part the team's staff came from the Headquarters of 7th Army Training Command. The majority of the trainers were from the Combat Maneuver Training Center and were part of the Green Observer Controller Team (OC).

The information from the questionnaire is consolidated and compiled by question: (See Appendix A)

1. PERSONAL INFORMATION:

Positions held by the four respondents during operation: Infantry Company Trainer, Armor Company Trainer (X2), and Logistical Operations Officer.

The Job Description for the Company Trainers were: Responsible for the POI development and execution. Receive, train and prepare replacement platoons for combat operations within the South West Asia theater of operations.

Responsible for five senior Non Commissioned Officers and supporting equipment.

Logistical Operations Officer: Provide internal logistical support to the team. Supervise the supply sergeant and supply accounts. Coordinate external support for the weapon system replacement operations with TAACOM. Coordinate and supervise the logistics support package for the training of the crews.

2. LOGISTICAL REQUIREMENTS:

A. INTERNAL TEAM REQUIREMENTS:

a. Internal team personnel requirements to train one platoon: Infantry Team, Two 11M40; Tank Team, Two 19K40 (Minimum is one).

b. Internal Team equipment used (for one platoon): One HUMMV per platoon, individual weapons, NBC equipment, M8 alarms, NVGs, compass, training manuals, training aids, one AN/GRC 46 radio, and binoculars.

c. Internal Team Equipment needed that was not available: Tents, portable generators, light sets, GPS navigation system, carpenters tool kit, and maps

d. Training equipment needed to support mission: Wood for targets, all necessary range equipment from FM 17-12-1, Training M256 kits, Boresight devices, Slides and or models for vehicle and aircraft identification.

e. Other internal team logistical requirements: None.

B. EXTERNAL TRAINING REQUIREMENTS:

a. Ammunition required to test equipment:

Per M1 Tank:

100 rounds 7.62 per machine gun (2 each)

100 rounds .50 caliber

40 rounds 5.56

20 rounds 9mm

3 rounds APFSDS (sabot)

2 rounds HEAT

Per M2/3 Bradley:

15 rounds 25mm HE

15 rounds 25mm AP

TOW training Missile

25 rounds linked 7.62

30 rounds 5.56 per dismount

400 rounds 5.56 linked for SAW

AT-4

Fragment grenade

2 rounds 40mm HE or TPT

b. Ancillary items needed that are not part of equipment: CVC Helmets, Water Cans, M8 Alarms, Binoculars, GPS Navigation Device, Maps, Compasses, Tie Down Straps, Cleaning Equipment, Camouflage system

c. Range Requirements: The firing area should be large enough to support the range fans for the M1 Tank and M2/3 Bradley. This is terrain dependent. The ranges will require plywood, 2x4 wood, and nails to construct targets.

Engineer support for building the targets and burms for the range. If no engineer support is available then the necessary tools to construct the targets.

d. Medical Support Requirements: One ambulance per four company size elements, if all the trainers are combat lifesavers. If combat lifesavers are not available then one medic with aid bag per company size element.

e. Fuel Requirements: The fuel requirements for both the M1 Tank and the M2/3 Bradley vary per day based on training event. On an average the M1 Tank will require 250 gallons twice a day. The M2/3 Bradley requires approximately 150 gallons a day. The fueling site in the operation was a fixed site. The training vehicles were required to come to the fixed site for resupply (supply point distribution). There should be sufficient class III package products at the refuel location.

f. Ration (Class I) Requirements: The ration cycle varied for the operation, but the recommended cycle was MRE, MRE, T-ration. The water requirements will depend on the climate, but the average was ten gallons per vehicle per day. The ten gallons per vehicle is without dismounts for the M2/3.

g. Maintenance Requirements: M1 Tank mechanics for both organizational and direct support maintenance are required. The mechanics should have access to the appropriate tools, test equipment, manuals, and repair parts. M2/3 Bradley mechanics for both organizational and

direct support are required. There should be a missile maintenance team when they fire on the range. The mechanics should have access to the appropriate tools, test equipment, manuals and repair parts. The operation should also have access to communications repair with a short turn around time. A small arms contact team should be available on range days.

h. Other requirements: None.

3. COMMAND AND CONTROL:

A. What was the chain of command structure:

Command Group: Colonel as commander, a LTC as a deputy, a Command Sergeant Major, three drivers

Operations Section: Major, Operations Officer, Logistics Operation Officer (Captain), Range Control Officer (Captain), Assistant Operations Officer (Captain), Chemical Officer (Captain)

Administrative Section: PSNCO, Supply Sergeant, Medic, 2 Supply clerks, one admin clerk.

Armor Team: Senior Trainer (Major), Four Company Teams (Captains), Each Company Team had four Platoon Trainers (SFC or SSG)

Infantry Team (Mech): Senior Trainer (Major), Three Company Teams (Captains), Each Company Team had four Platoon Trainers (SFC or SSG).

Light Infantry Team: Senior Trainer (Captain), Six platoon trainer.

The organization was capable of training and equipping at any given time a Battalion of Armor, a Battalion of Mech Infantry and a Company of Light Infantry.

B. Who coordinated equipment draw: The company trainers coordinated with the logistics operations officer. The logistics operations officer coordinated with the class VII issue officer of the Heavy Materiel Supply Company. The logistics officer also coordinated with the 22nd Support Command Class VII section for weapon system availability.

C. Who coordinated the training requirements: The Company Team trainers per predesignated training plan through the Chief (Armor or Infantry). The Chief in charge of the teams coordinated with the Operations Officer for changes in the schedule or resources. The training plans were approved by the commander of the operation.

D. How did you communicate on the range: Communications were adhoc, because of limited communications assets. Communications were accomplished by relay and scheduled net calls. Team Chiefs would otherwise have to drop to internal control nets to contact company trainers. The operations section did not have a base station and could not maintain communications with training teams.

E. Who coordinated for internal team needs: The company team NCOIC to the supply sergeant. The supply sergeant was able to handle the majority of the team's needs. If external support was required then the logistical operations officer coordinated for the support.

4. TRAINING REQUIREMENTS:

A. What were the different accessed/prescribed training levels: The first expected level was active component crews and platoons. The second level was reserve component crews and platoons. In both the first two levels the crews and platoons were deployed in unit integrity. The third level were individual ready reserve and AIT graduates forming crews and platoons.

B. What were the train-up time requirements per accessed training level:

Level one: Two days evaluation and confirmation, two days training, and one day recovery.

Level two: One day evaluation, three days training, one day reevaluation, Retrain (if needed), and one day recovery.

Level three: One day crew/platoon formation, four days training, one day evaluation, retrain if required, and 1 day recovery.

C. Describe the scope of the training conducted:

1. Individual Skills:

Weapons Individual

NBC

Troop leading procedures

Desert Survival

Land navigation

First aid

2. Crew:

Weapons on vehicle

Crew drills

Desert Maintenance

Vehicle survival

NBC

3. Collective

Battle drills

Movement formations

LOGPAC techniques

NBC

D. How many platoons were trained: There were 18 M1 tank platoons and 18 M2 Bradley platoons trained during the operation.

E. How did you lash up with the training platoons at the start of the training: The company training teams met the replacements at the AG replacement depot initially. This initial meeting was to establish a chain of command and determine if any soldiers had equipment shortages. The next meeting was at the equipment draw yard located at the Heavy Materiel Supply Company.

F. How did you conduct range training: Dismounts conducted small arms zero and field fire. M1 Tanks conducted boresighting, confirmation firing of all weapons, dry fire, TCGST and TCIC. The M2's conducted weapon zero

and engagement range, Coax and 25mm fired at prescribed targets to confirm zero and function of weapons.

G. What were the main components of the training:

1. Equipment Draw
2. Ammunition Draw
3. Load Plans
4. Ranges
5. Individual Skills
6. Crew Skills
7. Collective Skills
8. Recovery

H. Other comments on the training: None

5. ADDITIONAL COMMENTS:

There were many lessons learned from the weapon system replacement operation. The first one is that the issue yard should have ancillary items. This was almost a training stoppage, when crews deployed without CVC helmets. On top of the ancillary items, many of the weapon systems were short basic issue items (BII). The Heavy Materiel Supply Company should have BII items on hand to make up shortages. Another lesson learned was the requirement for dedicated maintenance. The Theater rear area did not have repair parts for the equipment nor mechanics. The training team also was a TDA unit and did not have organic maintenance nor messing facility. Also, there were a lack of radios. Each platoon trainer requires a two net

capability as well as the company trainer. The staff for the operation was designed for the training mission and not the support mission. A logistics staff is required for an operation of this magnitude.

APPENDIX C

FIGURE

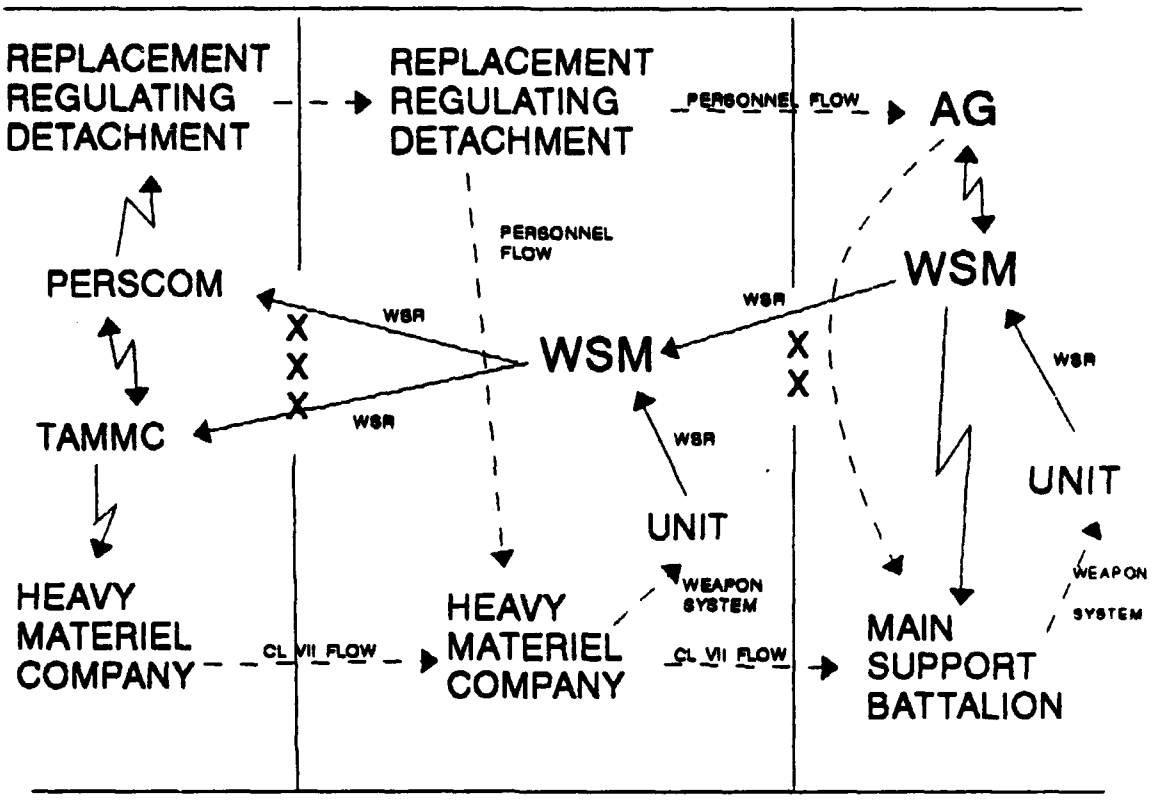

Figure 1. Weapon System Replacement Operations Flow

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